PROJECT LEAD THE WAY - BIOMEDICAL SCIENCES

Academic Content Standards and Curriculum Framework defined by Project Lead the Way, Inc.
http://www.pltw.org/curriculum/hs-biomedical-science.html

Teacher Requirements: http://doe.in.gov/dps/licensing/assignmentcode

HUMAN BODY SYSTEMS

5216 *(HUMAN SYST)*
CIP Code: 26.0101

Human Body Systems is a course designed to engage students in the study of basic human physiology and the care and maintenance required to support the complex systems. Using a focus on human health, students will employ a variety of monitors to examine body systems (respiratory, circulatory, and nervous) at rest and under stress, and observe the interactions between the various body systems. Students will use appropriate software to design and build systems to monitor body functions. Schools must agree to be part of the Project Lead the Way network and follow all training and data collection requirements.

- Suggested Grade Level: 10th grade or permission of instructor
- Recommended Prerequisite: Principles of the Biomedical Sciences
- Credits: One credit per semester, a two semester course
- Counts as an Elective or Directed Elective for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Content standards and competencies will be defined
- Counts toward the 8-10 Career-Technical credits required for Core 40 with Technical Honors Diploma
- A vocationally licensed (CTE) health science teacher or a teacher holding a secondary license in science education, who has successfully completed the PLTW summer training institute, may teach this course
- This course generates state vocational funding (APC) for schools with signed agreements with PLTW

MEDICAL INTERVENTION

5217
CIP Code: 14.0501

Medical Intervention is a course that studies medical practices including interventions to support humans in treating disease and maintaining health. Using a project-based learning approach, students will investigate various medical interventions that extend and improve quality of life, including gene therapy, pharmacology, surgery, prosthetics, rehabilitation, and supportive care. Students will also study the design and development of various interventions including vascular stents, cochlear implants, and prosthetic limbs. Lessons will cover the history of organ transplants and gene therapy with additional readings from current scientific literature addressing cutting edge developments. Using 3-D imaging software, students will design and build a model of a therapeutic protein. Schools must agree to be part of the Project Lead The Way network and follow all training and data collection requirements.

- Suggested Grade Level: 11th grade or permission of instructor
- Recommended Prerequisites: Principles of the Biomedical Sciences and Human Body Systems
- Credits: One credit per semester, a two semester course
- Counts as an Elective or Directed Elective for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Content standards and competencies will be defined
- Counts toward the 8-10 Career-Technical credits required for Core 40 with Technical Honors Diploma
- A vocationally licensed (CTE) health science teacher or a teacher holding a secondary license in science education, who has successfully completed the PLTW summer training institute, may teach this course
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PRINCIPLES OF THE BIOMEDICAL SCIENCES

5218
CIP Code: 51.1102

Principles of the Biomedical Sciences provides an introduction to this field through "hands-on" projects and problems. Student work involves the study of human medicine, research processes and an introduction to bioinformatics. Students investigate the human body systems and various health conditions including heart disease, diabetes, hypercholesterolemia, and infectious diseases. A theme through the course is to determine the factors that led to the death of a fictional person. After determining the factors responsible for the death, the students investigate lifestyle choices and medical treatments that might have prolonged the person's life.

Key biological concepts included in the curriculum are: homeostasis, metabolism, inheritance of traits, feedback systems, and defense against disease. Engineering principles such as the design process, feedback loops, fluid dynamics, and the relationship of structure to function will be included where appropriate. The course is designed to provide an overview of all courses in the Biomedical Sciences program and to lay the scientific foundation necessary for student success in the subsequent courses. Schools must agree to be part of the Project Lead the Way network and follow all training and data collection requirements.

- Suggested Grade Level: 9th grade or permission from instructor
- Recommended Prerequisite: None, but concurrent enrollment in Biology I is required
- Credits: One credit per semester, a two semester course
- Counts as an Elective and Directed Elective for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Content standards and competencies will be defined
- Counts toward the 8-10 Career-Technical credits required for Core 40 with Technical Honors Diploma
- A vocationally licensed (CTE) health science teacher or a teacher holding a secondary license in science education, who has successfully completed the PLTW summer training institute, may teach this course
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SCIENCE RESEARCH

5219
CIP Code: 51.1199

Science Research is a capstone course designed to give student teams the opportunity to work with one or more mentors from the scientific and/or medical community. Teams will identify a research topic, conduct research, write a scientific paper, and defend team conclusions and recommendations to a panel of outside reviewers. Students taking this course may consider working with peers enrolled in a PLTW: Pre-Engineering capstone course to jointly engineer a product that could impact healthcare.

- Suggested Grade Level: 12th grade or permission of the instructor
- Recommended Prerequisites: Principles of the Biomedical Sciences, Human Body Systems and Medical Intervention
- Credits: One credit per semester, a two semester course
- Counts as an Elective or Directed Elective for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Content standards and competencies will be defined
- Counts toward the 8-10 Career-Technical credits required for Core 40 with Technical Honors Diploma
- A vocationally licensed (CTE) health science teacher or a teacher holding a secondary license in science education, who has successfully completed the PLTW summer training institute, may teach this course
- This course generates state vocational funding (APC) for schools with signed agreements with PLTW